

REMARKS/ARGUMENTS

In view of the following discussion, the Applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 USC § 102(e). Thus, the Applicants believe that all of these claims are now in allowable form.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, the Examiner should telephone Ms. Janet M. Skafar, Esq. at (650) 988-0655 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Specification

The Examiner objected to the abstract of the disclosure because it should be limited to a single paragraph. In response, the Applicants have submitted a corrected abstract of the disclosure.

Status of Claims

Claims 1-5, 9-31, and 33-55 are pending in this application. Claims 6, 7, 8 and 32 have been canceled.

Claim objections

In response to the Examiner's objections, the Applicants have rewritten claim 9 in independent form, and included the limitations of claim 8, to place claim 9 in condition for allowance. In addition, the Applications have rewritten claim 33 in

independent form, and included the limitations of claim 32, to place claim 33 in condition for allowance.

Rejections under 35 USC § 102(e)

1. Claims 1, 4-8 and 32

The Examiner has rejected claims 1, 4-8 and 32 under 35 USC § 102(e) as being anticipated by the Liang et al Patent (U.S. Patent No. 6,445,773 B1, granted on Sept. 3, 2002 to Ronald Y. R. Liang et al).

In response Applicants have amended claim 1 to recite “determining data flow for the channel in terms of an input intensity λ_{in} , a probability of having a frame having no or a correctable number of errors p , and a maximum number of transmissions k of a frame.” The Applicants maintain that the Liang et al patent does not teach, explicitly or implicitly, determining a data flow based on a maximum number of transmissions of a frame. The Liang et al patent does not disclose, explicitly or implicitly, a maximum number of transmissions of a frame. Therefore, the Applicants respectfully submit that claim 1 is not anticipated by the Liang et al patent.

As to claim 4, the Applicants have amended claim 4 to recite: “determining an upstream data flow based on a maximum number of transmissions of each frame; and determining a downstream data flow based on a maximum number of transmissions of each frame.” The Applicants maintain that the Liang et al patent does not teach, explicitly or implicitly, determining a data flow based on a maximum number of transmissions of each frame. The Liang et al patent does not disclose, explicitly or implicitly, a maximum number of transmissions of a frame. Therefore, the Applicants submit that claim 4 is not anticipated by the Liang et al patent.

Claim 5 depends from claim 4 and is patentable for the same reasons as claim 4.

2. Claims 11-12, 17-18, 20-24, 26-31, 35-36, 41-42, 44-48 and 50-55

The Examiner has rejected claims 11-12, 17-18, 20-24, 26-31, 35-36, 41-42, 44-48 and 50-55 under 35 USC § 102(e) as being anticipated by the Levin et al Patent (U.S. Patent No. 6,625,777 B1, granted on Sept. 3, 2002 to Howard Earl Levin et al).

3. Claims 11-12, 17-18, 35-36 and 41-42

Independent claim 11 has been amended to recite that the bit load for at least one subchannel is determined based on “a number of symbols in an information field K of a frame, and a maximum number of transmissions k of the frame, and a number of bits per subchannel” and that the maximum number of symbol errors t , the number of symbols in the information field K of the frame and the maximum number of transmissions k for the frame are selected, such that a coding gain is increased.”

Applicants respectfully maintain that the Levin et al patent does not teach or suggest, either explicitly or implicitly, determining the bit load based on a maximum number of transmissions of a frame k , and selecting the maximum number of transmissions k such that the coding gain is increased.

The rejection cites column 2, lines 32-40, column 5, lines 45-67, column 6, lines 1-67 and column 9, lines 1-67 of the Levin et al patent as the teaching of determining a bit load based on a maximum number of transmissions k , in addition to other parameters. The Applicants maintain that column 2, lines 32-40, column 5, lines 45-67, column 6, lines 1-67 and column 9, lines 1-67 of the Levin et al patent do not teach, expressly or

inherently, determining a bit load based on a maximum number of transmissions k of a frame k .

Column 2, lines 30-40, of the Levin et al patent teaches a “method and apparatus that allows one to determine which configuration (e.g., coding or error correction configuration) provides an optimal coding gain performance for any given line or set of line characteristics including variable energy/bit, fixed bandwidth, and variable error-control coding parameters. Specifically, for implementation of an ADSL system, there is a need for a method to select the best configuration based on multicarrier SNR values and the different coding gains related to varied parameters of the error correction schemes.” Significantly, column 2, lines 30-40, of the Levin et al patent does not disclose, either expressly or inherently, a maximum number of transmissions k of a frame and determining a bit load based on a maximum number of transmissions k of the frame.

Column 5, lines 45-67, of the Levin et al patent discloses a method of selecting error correction for an ADSL transceiver pair. The Levin et al patent discloses determining a payload for the channel using Trellis coding, a payload for the channel using Reed-Solomon coding, and a payload for the channel using reed-Solomon/Trellis coding. The coding configuration providing the highest payload is selected. In addition, the Levin et al patent discloses determining a payload without any coding. Significantly, unlike the claimed invention, column 5, lines 45-67, of the Levin et al patent does not disclose, either expressly or inherently, a maximum number of transmissions k of a frame and determining a bit load based on a maximum number of transmissions k of the frame.

Column 6, lines 1-67, of the Levin et al patent discloses determining a maximum channel capacity, SNR reference tables which are updated with coding gains and performance margin, and a method of determining a payload for a channel using Trellis encoding. Significantly, unlike the claimed invention, column 5, lines 45-67, of the Levin et al patent does not disclose, either expressly or inherently, a maximum number of

transmissions k of a frame and determining a bit load based on a maximum number of transmissions k of the frame.

Column 9, lines 1-67, of the Levin et al patent discloses a payload, redundancy, SNR reference and capacity. Column 9, lines 1-67, of the Levin et al patent also discloses a method of determining a maximum payload for a channel with concatenated Trellis and Reed-Solomon encoding. Significantly, unlike the claimed invention, column 5, lines 45-67, of the Levin et al patent does not disclose, either expressly or inherently, a maximum number of transmissions k of a frame and determining a bit load based on a maximum number of transmissions k of the frame.

The rejection cites column 3, lines 15-21, of the Levin et al patent for the teaching of selecting a coding gain such that the coding gain is increased based on the maximum number of transmissions k of a frame. However, column 3, lines 15-31, of the Levin et al patent refer to a specific set of line characteristics “including variable energy/bit, fixed bandwidth, and variable error-coding parameters.” Column 3, lines 15-21, of the Levin et al patent also refers to selecting the best system configuration based on multicarrier SNR values and the different coding gains related to varied parameters of the error correction schemes. However, column 3, lines 15-21, of the Levin et al patent does not refer to selecting the coding gain based on the maximum number of transmissions k of a frame. Unlike the present invention, nowhere does the Levin et al patent disclose, either expressly or inherently, the maximum number of transmissions k of the frame as another parameter to select.

The rejection also cites column 5, lines 28-53, of the Levin et al patent. However, column 5, lines 28-53, of the Levin et al patent is directed to a method of selecting error correction, determining a payload based on different encoding schemes – Trellis coding, Reed-Solomon coding and concatenated Reed-Solomon/Trellis coding. In addition, column 5 lines 28-53, of the Levin et al patent teaches that a target SNR reference table for a desired bit error rate (BER) is selected. Each value of the SNR_{ref(i)} of the SNR reference

table is then adjusted based on performance margin (PM) information. Significantly, the Levin et al patent does not disclose, either expressly or inherently, a maximum number of transmissions k of a frame. In addition, the Levin et al patent does not teach the selecting of the maximum number of transmissions k of a frame such that the coding gain is increased.

The rejection also cites column 10, lines 10-67, of the Levin et al patent. However, column 10, lines 10-67, of the Levin et al patent refers to the SNR reference table and selecting the SNR reference table for a desired bit error rate, and then updating the selected SNR reference table based on coding gain and performance margin. Column 10, lines 10-67, of the Levin et al patent discloses a maximum number of bits per channel (NMAX). However, column 10, lines 10-67, of the Levin et al patent does not teach, either explicitly or implicitly, the a maximum number of transmissions k of a frame. In addition, column 10, lines 10-67, of the Levin et al patent does not teach the selecting of the maximum number of transmissions k of a frame such that the coding gain is increased.

The rejection further cites column 12, lines 48-55, of the Levin et al patent. Column 12, lines 48-55, of the Levin et al patent teaches “by intelligently selecting error correction methods and parameters on a per channel basis based on measured SNR and other channel characteristics, payload usable for data transmission may be greatly increased. Increased payload from the intelligent selective error correction methodology described in this application, can lead to improved transmission work data rates and thereby result in more data, video text, and voice, over a given channel and system.” Significantly, unlike the claimed invention, column 12, lines 48-55, of the Levin et al patent does not refer to the selecting error correction methods and parameters based on a maximum number of transmissions k of a frame.

For the foregoing reasons, Applicants submit that claim 11 is not anticipated by the Levin et al patent, and is therefore patentable. Independent claim 11, as it currently stands, contains suitable limitations directed at the distinguishing aspects of the present invention. This claim, with these limitations shown in a bolded typeface, recites as follows:

“A method of increasing a bit load of a multicarrier system comprising a channel having a plurality of subchannels, comprising:

determining a bit load for at least one subchannel based on a target symbol error rate ϵ_s , a maximum number of symbol errors that can be corrected t , a number of symbols in an information field K of a frame, and **a maximum number of transmissions k for the frame**, and a number of bits per subchannel; and

selecting the maximum number of symbol errors t , the number of symbols in the information field K of a frame and **the maximum number of transmissions k for the frame**, such that a coding gain is increased.” [emphasis added]

As such, the Applicants submit that independent claim 11 is not anticipated by the teachings in the Levin et al patent. Hence independent claim 11 is patentable. Claims 12 and 17 depend from claim 11 and Applicants submit that claims 12 and 17 are patentable for the same reasons as claim 11.

Claims 18, 35, and 42 were also rejected for the same reasons as claim 11. Because claims 18, 35 and 42 contain similar distinguishing limitations to claim 11, claims 18, 35 and 42 are patentable for the same reasons as claim 11. In addition, claims 36 and 41 depend from claim 35 and are patentable for the same reasons as claim 35.

4. Claims 20-24 and 44-48

Independent claim 20 was also rejected as being anticipated by the Levin et al patent. Applicant submits that the Levin et al patent does not disclose, either expressly or inherently, all the limitations of claim 20. The Levin et al patent does not disclose selecting a maximum number of transmissions k of the frame based on the SNR ratio and number of subchannels associated with the SNR ratio. In addition, claim 20 also has the distinguishing limitation of transmitting information in accordance with the maximum number of transmissions k of the frame.

The rejection cites column 1, lines 38-67, column 3, lines 15-22, column 5, lines 28-67, column 6, lines 1-67, column 7, lines 21-67, column 10, lines 11-67, column 12, lines 48-67 and column 14, lines 37-40 of the Levin et al patent for the teaching of selecting a number of discrete multi-tone symbols based on a maximum number of transmissions k of a frame. However, neither column 1, lines 38-67, column 3, lines 15-22, column 5, lines 28-67, column 6, lines 1-67, column 7, lines 21-67, column 10, lines 11-67, column 12, lines 48-67 or column 14, lines 37-40 of the Levin et al patent disclose a maximum number of transmissions k for a frame. Therefore, column 1, lines 38-67, column 3, lines 15-22, column 5, lines 28-67, column 6, lines 1-67, column 7, lines 21-67, column 10, lines 11-67, column 12, lines 48-67 and column 14, lines 37-40 of the Levin et al patent do not disclose, either expressly or inherently, selecting a number of discrete multi-tone symbols based on a maximum number of transmissions k of a frame.

The rejection cites column 1, lines 30-34 of the Levin et al patent for the teaching of transmitting information in accordance with the maximum number of transmissions k . Column 1, lines 30-34 teaches that “ADSL systems using DMT split the available bandwidth into a number of discrete subchannels, also called bands or bins. Each subchannel carries a portion of the total information being transmitted.” Unlike the claimed invention, column 1, lines 30-34 of the Levin et al patent does not teach, either expressly or inherently, a maximum number of transmissions k of a frame. Therefore, column 1, lines 30-34 of the Levin et al patent does not disclose, either expressly or inherently, transmitting information in accordance with the maximum number of transmissions k of the frame.

The rejection also cites column 3, lines 58-60 of the Levin et al patent for the teaching of transmitting information in accordance with a maximum number of transmissions. Column 3, lines 58-60 of the Levin et al patent states that: “a standard compliant ADSL system has the ability to transmit data using four error correction

configurations: 1) no error correction, 2) Trellis code error correction only” Unlike the claimed invention, column 3, lines 58-60 of the Levin et al patent does not disclose, either expressly or inherently, transmitting information in accordance with a maximum number of transmissions k of the frame.

The rejection further cites column 5, lines 31-37 of the Levin et al patent for the teaching of transmitting information in accordance with a maximum number of transmissions. Column 5, lines 31-37 of the Levin et al patent states that: “the selected error correction method/parameters are sent by the remote transceiver 34 to the central office transceiver 42. Options, such as rate options are then received by transceiver 34 from the central office transmitter such as transceiver 42 at step 220. At step 222, one rate is selected (further discussed hereinafter with reference to FIG. 10) and the selected rate option is then transmitted to the appropriate paired transceiver.” Column 5, lines 31-37 of the Levin et al patent does not mention a maximum number of transmissions. Unlike the claimed invention, column 3, lines 58-60 of the Levin et al patent does not disclose, either expressly or inherently, transmitting information in accordance with the maximum number of transmissions k of the frame.

For the foregoing reasons, Applicants submit that claim 20 is not anticipated by the Levin et al patent, and is therefore patentable. Claims 21-24 depend, either directly or indirectly, from claim 20, and are patentable for the same reasons as claim 20.

Claim 44 has similar distinguishing limitations to claim 20, and is patentable for the same reasons as claim 20. Claims 45-48 depend, either directly or indirectly, from claim 44, and are patentable for the same reasons as claim 44.

5. Claims 26-31 and 50-55

Claim 26 was also rejected based on the Levin et al patent. The rejection cites column 11, lines 46-59 of the Levin et al patent for the teaching of transmitting a negative acknowledgment when an information frame is non-correctable. However, column 11, lines 46-59 on the Levin et al patent is directed to analyzing and selecting rate options. There is no disclosure, either explicitly or implicitly, of transmitting a negative acknowledgment when an information frame is non-correctable.

The rejection also cites column 11, lines 46-59 of the Levin et al patent for the teaching of transmitting the information frame if the information frame has not been transmitted a predetermined number of times from the upstream direction. Unlike the claimed invention, column 11, lines 46-59 of the Levin et al patent, does not teach transmitting the information frame if the information frame has not been transmitted a predetermined number of times from the upstream direction. Column 11, lines 46-59 of the Levin et al patent is directed to analyzing and selecting a rate option. Column 11, lines 46-59 of the Levin et al patent, does not disclose, either expressly or inherently, the counting of the number of times that an information frame is transmitted. Furthermore, column 11, lines 46-59 of the Levin et al patent does not teach any cutoff after which an information frame is no longer transmitted.

For the foregoing reasons, the Applicants submit that claim 26 is not anticipated by the Levin et al patent, and is therefore patentable. Because claims 27-31 depend from claim 26, claims 27-31 are patentable for the same reasons as claim 26. Because claim 50 has similar distinguishing limitations to claim 44, claim 50 is patentable for the same reasons as claim 44. Because claims 51-55 depend from claim 50, claims 51-55 are patentable for the same reasons as claim 50.

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Conclusion

Consequently, the Applicants believe that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

Respectfully submitted,

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Peter L. Michaelson, Attorney
Reg. No. 30,090
Customer No. 007265
(732) 530-6671

MICHAELSON & ASSOCIATES
Counselors at Law
Parkway 109 Office Center
328 Newman Springs Road
P.O. Box 8489
Red Bank, New Jersey 07701

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